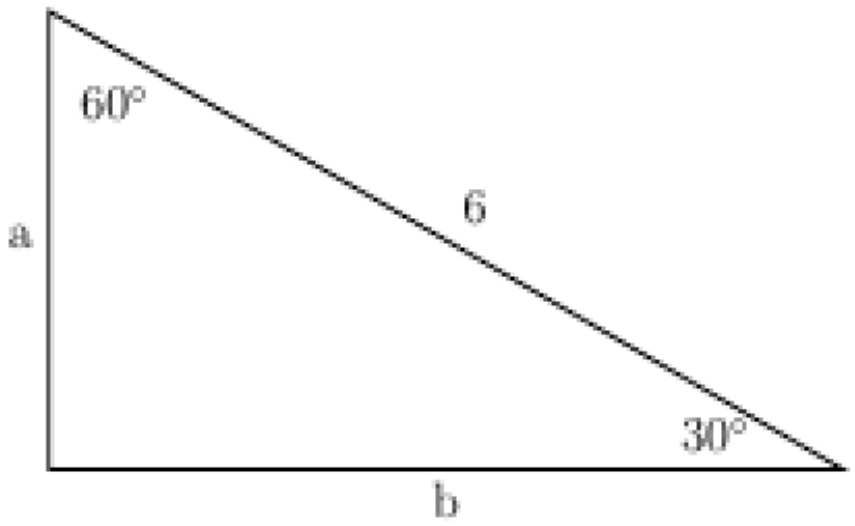
Topic: 30-60-90 triangles

Question: What are the lengths of the missing sides?



Answer choices:

A $a = 3\sqrt{3}$ and $b = 3$

B $a = 3$ and $b = 3\sqrt{3}$

C $a = 3$ and $b = 4$

D $a = 3$ and $b = 3$

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Solution: B

The pattern for the sides of a 30-60-90 triangle is x, $x\sqrt{3}$, and $2x$, where x is the short leg, $x\sqrt{3}$ is the long leg, and $2x$ is the hypotenuse. In this case, we know 6 is the hypotenuse, which is represented by $2x$.

Write $2x = 6$ and solve for x.

$$2x = 6$$

$$x = 3$$

The short leg, a, is 3.

The long leg, b is $x\sqrt{3} = 3\sqrt{3}$.

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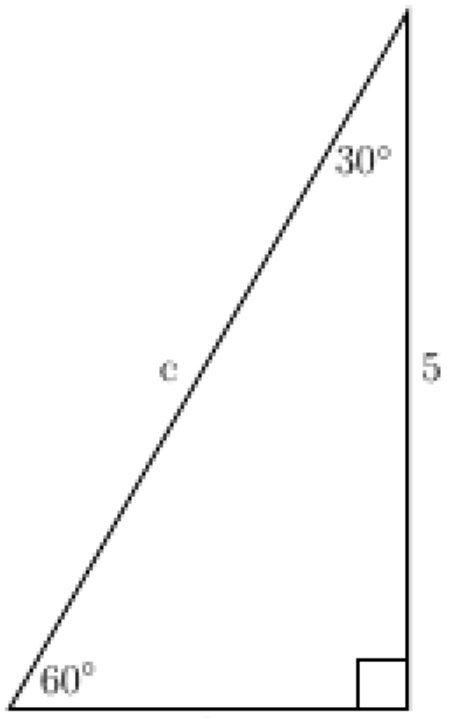

Answer choices:

A $a = \frac{10\sqrt{3}}{3}$ and $c = \frac{5\sqrt{3}}{3}$

B $a = \frac{5\sqrt{3}}{3}$ and $c = \frac{10\sqrt{3}}{3}$

C $a = 5\sqrt{3}$ and $c = 10$

D $a = 5\sqrt{3}$ and $c = 5$

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Solution: B

The pattern for the sides of a 30-60-90 triangle is x, $x\sqrt{3}$, and $2x$, where x is the short leg, $x\sqrt{3}$ is the long leg, and $2x$ is the hypotenuse. In this case, we know 5 is the long leg, which is represented by $x\sqrt{3}$.

Write $x\sqrt{3} = 5$ and solve for x.

$$x\sqrt{3} = 5$$

$$x = \frac{5}{\sqrt{3}}$$

Rationalizing the denominator, we get

$$x = \frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$$

The short leg, a, is $\frac{5\sqrt{3}}{3}$.

The hypotenuse, c is $2x$, which would be $2 \cdot \frac{5\sqrt{3}}{3} = \frac{10\sqrt{3}}{3}$.

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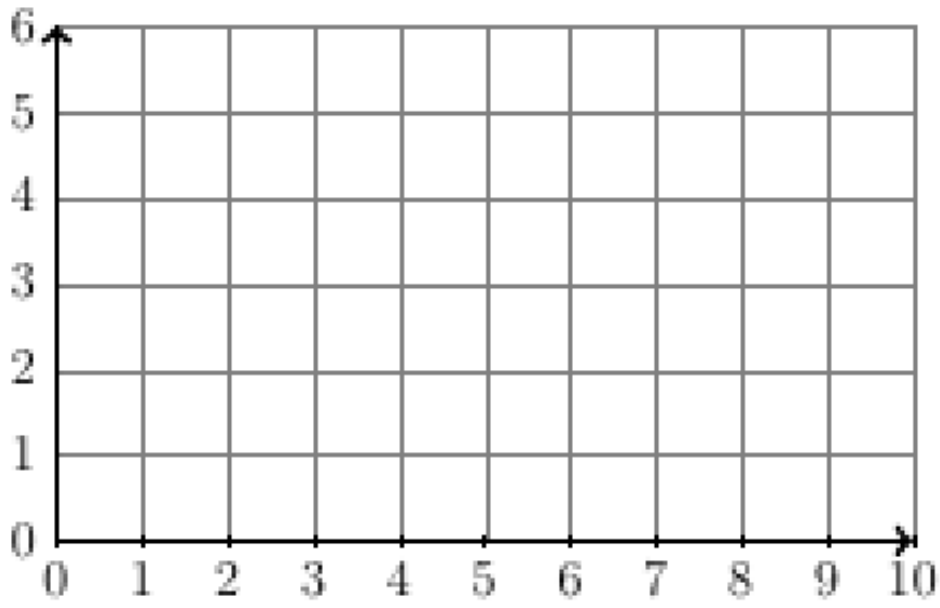
Topic: 30-60-90 triangles

Question: Find the correct angle.

In 30-60-90 ΔSAM, S is at $(0,0)$, A is at $\left(4\sqrt{3},3\right)$, and M is at $\left(4\sqrt{3},0\right)$. Which angle is the 60° angle?



Answer choices:

A S

B A

C M

D None of these

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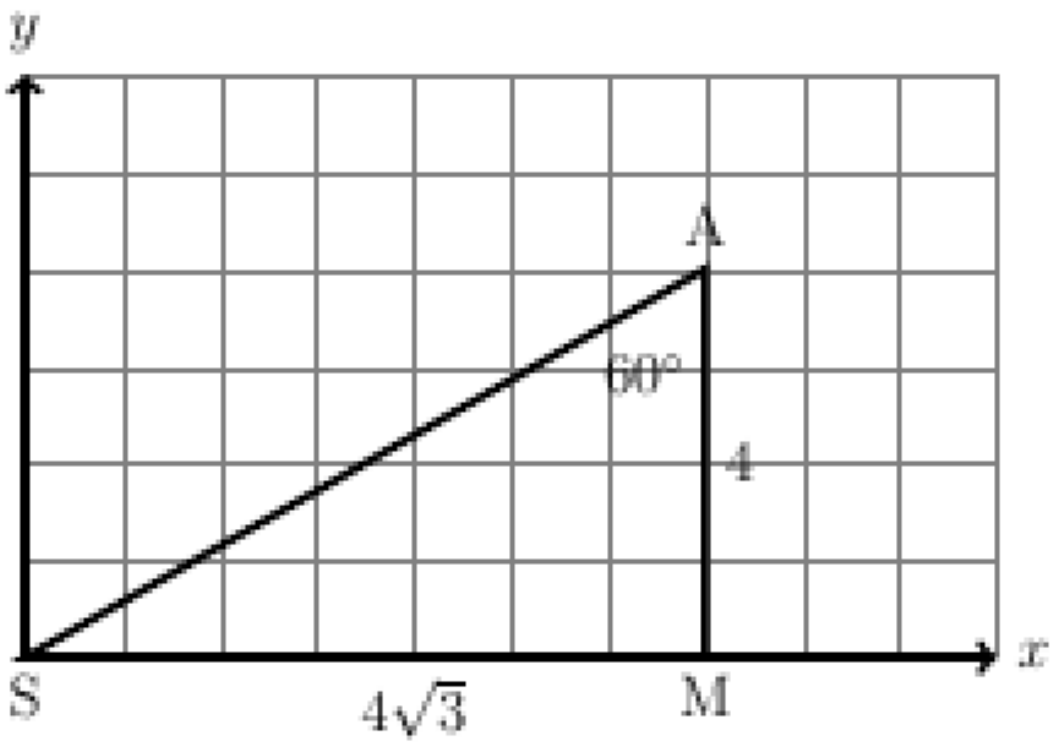
Solution: B

In a 30-60-90 triangle the angle opposite the long leg is the 60° angle.



That would be angle A.

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